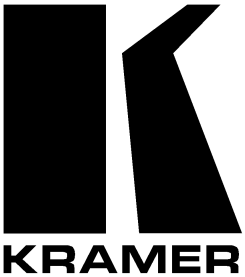
Kramer Electronics, Ltd.



USER MANUAL

Model:

VP-23xl

4x1 Presentation Switcher

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1 Introduction

Welcome to Kramer Electronics (since 1981): a world of unique, creative and affordable solutions to the infinite range of problems that confront the video, audio and presentation professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 350-plus different models now appear in 8 Groups[1], which are clearly defined by function.

Congratulations on purchasing your Kramer **VP-23xl** *4x1 Presentation Switcher*. This product is ideal for the following typical applications:

- Presentation and conference room systems
- Production studios, rental and staging

The package includes the following items:

- **VP-23xl** *4x1 Presentation Switcher*
- Power cord
- Windows®-based Kramer control software
- Null-modem adapter
- This user manual[2]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual

3 Overview

The **VP-23xl** is a high quality presentation switcher designed for a wide variety of presentation and multimedia applications. The **VP-23xl** is a one-box solution for installations that would otherwise require several separate products and is designed so that each section is controllable independently from the other sections.

1 GROUP 1: Distribution Amplifiers; GROUP 2: Video and Audio Switchers, Matrix Switchers and Controllers; GROUP 3: Video, Audio, VGA/XGA Processors; GROUP 4: Interfaces and Sync Processors; GROUP 5: Twisted Pair Interfaces; GROUP 6: Accessories and Rack Adapters; GROUP 7: Scan Converters and Scalers; and GROUP 8: Cables and Connectors

2 Download up-to-date Kramer user manuals from our Web site at http://www.kramerelectronics.com

In addition the **VP-23xl**:

- Includes 16 selector buttons and front panel adjustments of VGA / XGA output level and EQ., master audio output level and microphone level
- Recalls previous setup via the non-volatile memory
- Is controllable via the front panel buttons or by RS-232 serial commands transmitted by a touch screen system, PC, or other serial controller
- Includes an additional audio switching section that routes one of the pre-selected audio inputs from the other switching sections to a separate output
- Supports changing the master audio output levels via RS-232 commands
- Combines the functions of a 4x1 switcher for composite video and audio, a 4x1 switcher for s-Video and audio, and a 4x1 switcher for VGA/XGA type signals with audio
- Allows microphone switching or talk-over
- Includes a built-in *IR* (Infra-Red) Receiver

Achieving the best performance means:

- Connecting only good quality connection cables, thus avoiding interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low quality cables)
- Avoiding interference from neighboring electrical appliances that may adversely influence signal quality
- Positioning your Kramer **VP-23xl** in a location free from moisture and away from excessive sunlight and dust

4 Your Presentation Switcher

Figure 1 illustrates the front and rear panels of the **VP-23xl**. Tables 1 and 2 define the front and rear panels of the **VP-23xl**, respectively.

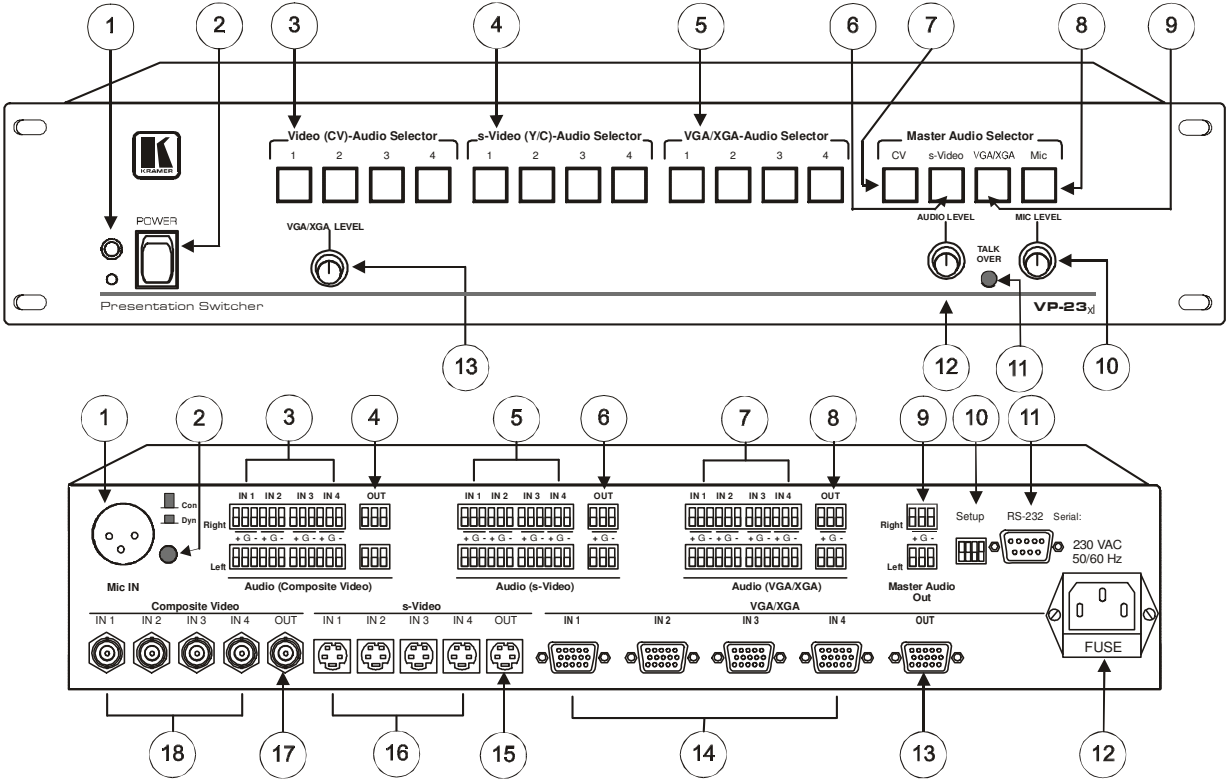

Figure 1: VP-23xl 4x1 Presentation Switcher

Table 1: Front Panel VP-23xl Presentation Switcher Features

#	Feature	Function
1	*IR* (Infra-Red) Receiver	Signals from the remote control transmitter illuminate the LED
2	*Power* Switch	Illuminated switch supplying power to the unit
3	*Video (CV)-Audio Selector* Buttons	Selects the composite video / audio source from 1 to 4
4	*s-Video (Y/C)-Audio-Selector* Buttons	Selects the s-Video / audio source from 1 to 4
5	*VGA/XGA-Audio-Selector* Buttons	Selects the VGA/XGA video / audio source from 1 to 4
6	*s-Video* Button	Master Audio Selector button for s-Video
7	*CV* Button	Master Audio Selector button for composite video
8	*Mic* Button	Master Audio Selector button for microphone
9	*VGA/XGA* Button	Master Audio Selector button for VGA/XGA
10	*Mic Level* Knob	Adjusts the microphone level
11	*TALK OVER* Button	Pushing in button activates talk over
12	*AUDIO LEVEL* Knob	Adjusts the audio level
13	*VGA/XGA Level* Knob	Adjusts the VGA/XGA level

Table 2: Rear Panel VP-23xl Presentation Switcher Features

#	Feature	Function
1	*Mic IN* Connector	Connects to the microphone
2	*Con / Dyn* Switch	Pushing *in* selects a dynamic microphone, pushing *out* selects a condenser
3	*Audio (Composite Video) IN* Terminal Block Connectors	Connects the balanced audio sources from 1 to 4 (for the composite video)
4	*Audio (Composite Video) OUT* Terminal Block Connector	Connects the balanced audio acceptor (for the composite video)
5	*Audio (s-Video) IN* Terminal Block Connectors	Connects the balanced audio sources from 1 to 4 (for the s-Video)
6	*Audio (s-Video) OUT* Terminal Block Connector	Connects the balanced audio acceptor (for the s-Video)
7	*Audio (VGA/XGA) IN* Terminal Block Connectors	Connects the balanced audio sources from 1 to 4 (for the VGA/XGA video)
8	*Audio (*VGA/XGA*) OUT* Terminal Block Connector	Connects the VGA/XGA balanced audio acceptor (for the VGA/XGA video)
9	*Master Audio Out* Terminal Block Connector	Connects the routed balanced audio channel
10	*Setup*	Dipswitches for setup (refer to section 4.1.2)
11	*RS-232* Connector	DB 9F connector connects to PC or Serial Controller
12	Power Connector with *Fuse*	AC connector enabling power supply to the unit
13	VGA/XGA *OUT HD15* Connector	Connects to the VGA/XGA video acceptor
14	VGA/XGA *IN HD15* Connectors	Connects the VGA/XGA video sources from 1 to 4
15	*s-Video OUT* 4p Connector	Connects to the s-Video acceptor
16	*s-Video IN* 4p Connectors	Connects the s-Video sources from 1 to 4
17	*Composite Video OUT* BNC Connector	Connects to the composite video acceptor
18	*Composite Video IN* BNC Connectors	Connects the composite video sources from 1 to 4

4.1 Connecting the VP-23xl

To connect the **VP-23xl**, connect as follows[1] to the rear panel[2]:

1. The required Composite, s-Video and VGA/XGA video sources and acceptors as well as the appropriate balanced audio sources and acceptors.
2. A dynamic microphone or a condenser[3], if required.
3. The power cord.

Note: Set each of the 3 front panel control level knobs[4] to their mid position.

In addition, you can choose to connect the following options:

1. A PC via the null-modem adapter (when using the *Kramer Control software* or other controller).
2. An audio amplifier to the Master Audio Out connector[5].

1 Switch OFF the power on each device before connecting it to your VP-23xl. After connecting your VP-23xl, switch on its power and then switch on the power on each device. Switching on the VP-23xl, recalls the previous setup from the non-volatile memory

2 You do not need to connect all inputs

3 Use the Con / Dyn switch (refer to the rear panel, item 2 in Figure 1) to select a dynamic microphone or a condenser

4 MIC Level, Audio Level and VGA/XGA Level

5 As in scenario B in Figure 4

4.1.1 Connecting a PC

You can connect a PC (or other controller) to the **VP-23xl** via the RS-232 port.

To connect using the Null-modem adapter provided with the machine (recommended method):

- Connect the RS-232 DB9 rear panel port on the **VP-23xl** to the Null-modem adapter and connect the Null-modem adapter with a 9 wire flat cable to the RS-232 DB9 port on your PC

To connect without using a Null-modem adapter:

- Connect the RS-232 DB9 port on your PC to the RS-232 DB9 rear panel port on the **VP-23xl**, as Figure 2 illustrates (depending on whether the PC has a 9-pin or 25-pin connector)

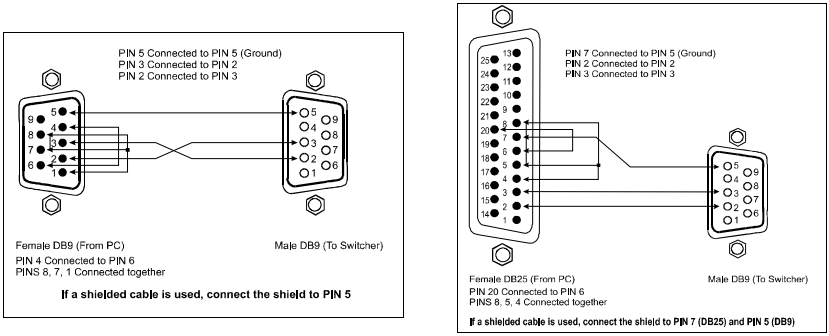

Figure 2: Connecting a PC without using a Null-modem Adapter

4.1.2 Dipswitch Settings

You can connect up to 16 **VP-23xl** units to the PC via the Null-modem adapter, and the RS-232 ports as Figure 3 illustrates. Adjust the dipswitches on the other units according to the information in Table 3:

Table 3: Dipswitch Settings

Machine #	Self Address				Dipswitch			
	3	2	1	0	1	2	3	4
1 Master	0	0	0	0	ON	ON	ON	ON
2	0	0	0	1	ON	ON	ON	OFF
3	0	0	1	0	ON	ON	OFF	ON
4	0	0	1	1	ON	ON	OFF	OFF
5	0	1	0	0	ON	OFF	ON	ON
6	0	1	0	1	ON	OFF	ON	OFF
7	0	1	1	0	ON	OFF	OFF	ON
8	0	1	1	1	ON	OFF	OFF	OFF
9	1	0	0	0	OFF	ON	ON	ON
10	1	0	0	1	OFF	ON	ON	OFF
11	1	0	1	0	OFF	ON	OFF	ON
12	1	0	1	1	OFF	ON	OFF	OFF
13	1	1	0	0	OFF	OFF	ON	ON
14	1	1	0	1	OFF	OFF	ON	OFF
15	1	1	1	0	OFF	OFF	OFF	ON
16	1	1	1	1	OFF	OFF	OFF	OFF

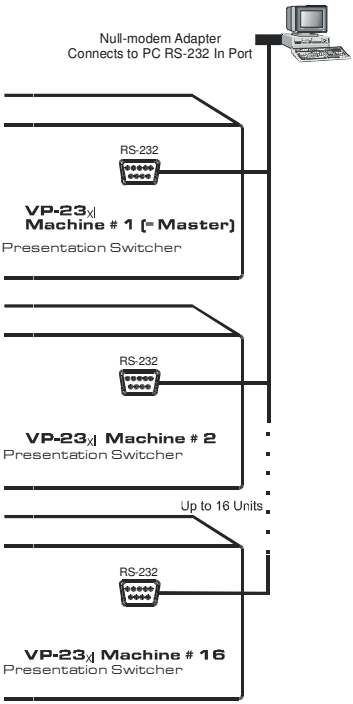

Figure 3: RS-232 Connections

4.1.3 Connecting a Projector to the VP-23xl

To connect a projector, as scenario B in Figure 4 illustrates, connect:

1. The Composite Video OUT, the s-Video OUT and the VGA/XGA OUT connectors to the respective video inputs on the projector.
2. The Master Audio Out connector to the balanced audio input on the audio amplifier. Select any one of the 12 audio inputs to route to the Master Audio Out.

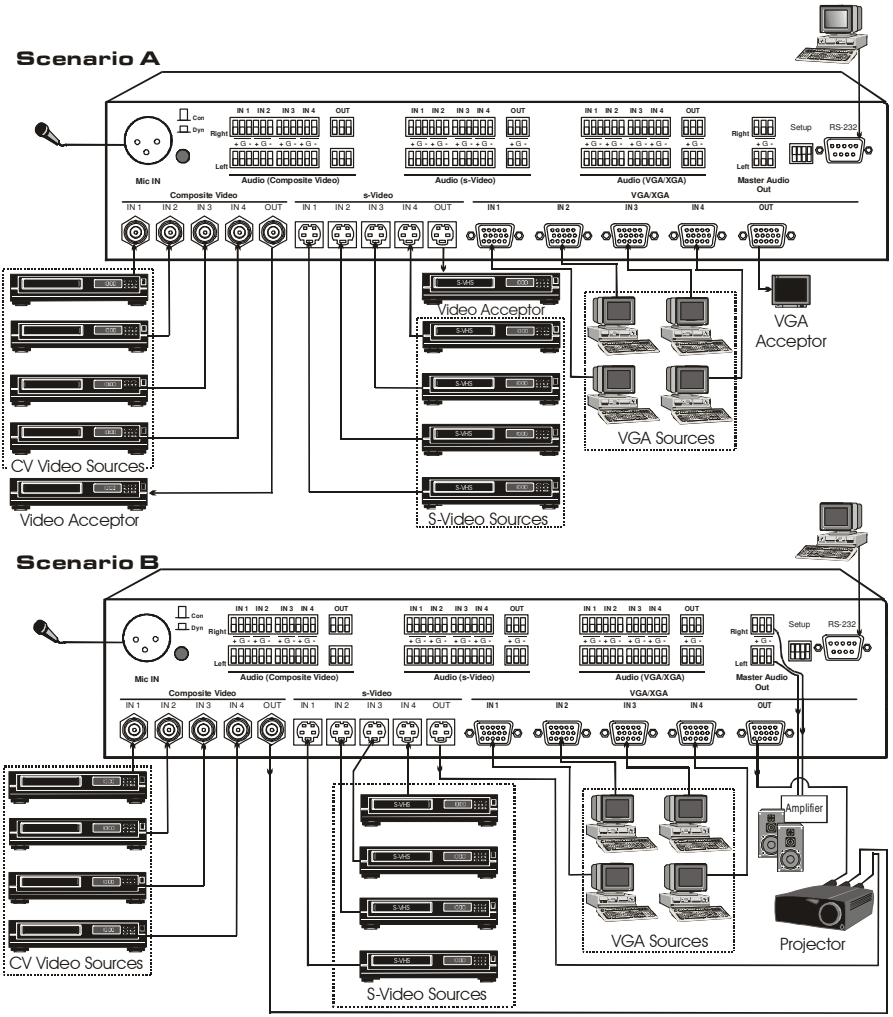

Figure 4: VP-23xl 4x1 Presentation Switcher Connections

5 Understanding Your Switcher

You can operate your **VP-23xl** via:

- The buttons and the control level knobs on the front panel, as sections 5.1 and 5.2 describe, respectively
- RS-232 serial commands transmitted by a touch screen system, PC[1], or other serial controller

5.1 The Front Panel Buttons

The front panel buttons include the following:

- Video (CV)-Audio Selector buttons (1 to 4)
- s-Video (Y/C)-Audio Selector buttons (1 to 4)
- VGA/XGA-Audio Selector buttons (1 to 4)
- Master Audio Selector buttons (CV, s-Video, VGA/XGA and Mic)
- TALK OVER button[2]

5.2 The Front Panel Control Level Knobs

The adjustable front panel control level knobs[3] include:

- *Mic Level* that adjusts the microphone level at the Master Audio Out connector and the talk-over function threshold[4]
- *Audio Level* that adjusts the overall balanced audio output level at the Master Audio Out connector, without influencing any other audio output
- *VGA/XGA Level* that adjusts a VGA/XGA image, for example, for images which are dim or lacking in sufficient detail, perhaps due to the use of long cables[5]

1 For instructions on using the Windows®-based Control Software, refer to the separate user manual (included on the CD-ROM in .pdf format), *Kramer Control Software*

2 With the TALK OVER button pressed in, speaking into the microphone amplifies the voice of the speaker, overriding and fading out all other audio channels. However, pressing the Mic button in the Master Audio Selector renders the Talk Over function inactive

3 You can also adjust the AUDIO LEVEL on the VP-23xl using the Kramer Control Software

4 Achieving optimum results for a particular environment when using a microphone may require experimentation in adjusting the AUDIO and MIC LEVELS

5 We recommend using a Line Amplifier when connecting long cables

6 Operating Your Switcher

Section 6.1 describes switching, and section 6.2 describes how to connect the Master Audio Output.

6.1 Switching

You can switch one of the 4 CV inputs, one of the 4 Y/C inputs and one of the 4 VGA/XGA inputs to the corresponding CV, Y/C or VGA/XGA outputs, respectively.

To switch an input to an output:

- Press one[1] button from the set of 4 buttons in the Video (CV)-Audio section and/or[2] one button from the set of 4 buttons in the s-Video (Y/C)-Audio section and/or one button from the set of 4 buttons in the VGA/XGA-Audio section
  Each pressed button illuminates[3], indicating selection and outputting of that video and audio source

Figure 5 illustrates how to switch s-Video input 3:

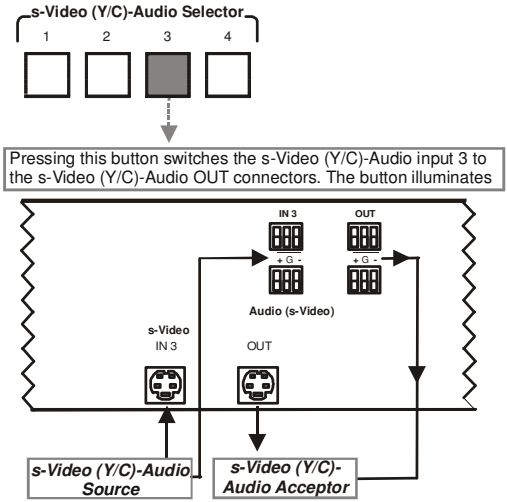

Figure 5: Switching an Input to an Output

1 You cannot select more than one button in a section

2 You can overlook a section and choose not to select a button from it

3 Pressing an illuminated button for more than 2 seconds will disconnect the output and the button will no longer illuminate

6.2 Connecting the Master Audio Output

By default[1], stereo audio signals switch together with the video, that is, the unit is set in audio-follow-video[2] (AFV) mode. Change to breakaway mode[3], via RS-232.

You can generate a master audio output (pre-selected from a switching section) at the Master Audio Out connector.

To generate a master audio output:

- Press one of the first 3 buttons (CV, s-Video or VGA/XGA) from the Master Audio Selector section (if one is not already selected)
  The button illuminates, indicating selection and routes the audio channel of the selected source (CV, s-Video or VGA/XGA) to the Master Audio Out connector as well as to the appropriate Audio OUT connector

Pressing the illuminating Master Audio Selector button for more than 2 seconds disconnects that Master Audio output, and the button no longer illuminates. The broadcast will continue to display but without sound.

Pressing the Mic Master Audio Selector button, while the selected Master Audio Selector button illuminates, will disconnect the illuminated Master Audio Selector button. The broadcast will continue to display with the sound of the microphone only.

Figure 6 illustrates how to route the audio channel of VGA/XGA-Audio input 4 to generate an additional VGA/XGA audio channel at the Master Audio Out connector.

1 That is, the pre-installed factory default

2 In which all operations relate to both the video and the audio channels

3 In which video and audio channels switch independently

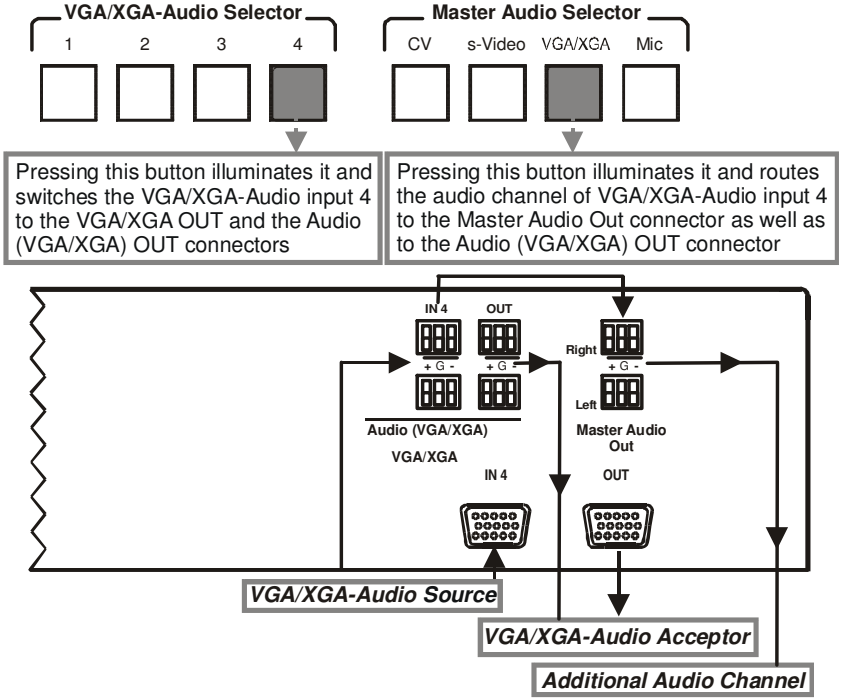

Figure 6: Generating a Master Audio Output

7 Technical Specifications

Table 4 includes the technical specifications:

Table 4: Technical Specifications of the VP-23xl Presentation Switcher

Inputs:	4 VGA / XGA on HD15F connectors, 4 s-Video, 1 Vpp (Y), 0.3Vpp (C) / 75 Ω on 4 pin connectors, 4 composite video 1Vpp / 75 Ω on BNCs Each input is accompanied by the appropriate balanced stereo-audio channels: +4dBm / 50 kΩ on detachable terminal block connectors. Mic: 3mV / 10 kΩ condenser / dynamic on an XLR connector
Outputs:	1 x VGA / XGA, 1 s-Video - 1 Vpp (Y), 0.3Vpp (C), / 75 Ω on 4 pin connector, 1 composite video 1 Vpp / 75 Ω on a BNC Each output is accompanied by the appropriate balanced stereo-audio channel: +4dBm / 150 Ω, 1 master audio +4dBm / 150 Ω
Bandwidth:	XGA / VGA: 315 MHz; s-Video (Y): 260 MHz; composite video: 470 MHz; audio: 40kHz
S/N Ratio:	Video: 75 dB all channels; audio: 75 dB / 1 Vpp all channels
Diff. Gain:	<0.07% all channels
Diff. Phase:	<0.05 Deg. all channels
Control:	17 selector buttons; VGA/XGA level: up to 4 dB gain; audio: up to 6 dB gain, Mic: up to 49 dB gain
Max Output:	Video: 2.1 Vpp; audio: 27 Vpp
Dimensions:	19-inch (W), 7-inch (D) 2U (H) rack-mountable
Power Source:	230 VAC, 50/60 Hz, (115VAC, U.S.A.) 16VA
Weight:	3.8 kg (8.4 lbs.) approx
Accessories:	Power cord, PC control software

8 Hex Table

Table 5 lists the Hex values (which the protocol in section 9 describes in more detail) for the **VP-23xl** 4x1 Presentation Switcher:

Table 5: VP-23xl Hex Table

Inputs		Composite Video OUT and Audio OUT CV	s-Video OUT and Audio OUT s-Video	VGA OUT and Audio OUT VGA
Group	#			
Composite Video	In 1	01 81 81 81		
	In 2	01 82 81 81		
	In 3	01 83 81 81		
	In 4	01 84 81 81		
s-Video	In 1		01 81 82 81	
	In 2		01 82 82 81	
	In 3		01 83 82 81	
	In 4		01 84 82 81	
VGA	In 1			01 81 83 81
	In 2			01 82 83 81
	In 3			01 83 83 81
	In 4			01 84 83 81

Master Audio Selector (Group Audio OUT)	Audio Master OUT
Composite Video Audio OUT	02 81 81 81
s-Video Audio OUT	02 82 81 81
VGA Audio OUT	02 83 81 81
Microphone	02 84 81 81
Disconnect All	02 80 81 81

9 Communication Protocol

This protocol, which enables RS-232 communication between the **VP-23xl** and the PC, uses 4 bytes of information, and data is at 9600 baud, no parity, 8 data bits and 1 stop bit.

Table 6: Protocol Definitions

MSB **LSB**

	DESTINATION	INSTRUCTION					
0	D	N5	N4	N3	N2	N1	N0
7	6	5	4	3	2	1	0

1st byte

				INPUT			
1	0	0	0	0	I2	I1	I0
7	6	5	4	3	2	1	0

2nd byte

						OUTPUT	
1	0	0	0	0	0	O1	O0
7	6	5	4	3	2	1	0

3rd byte

			MACHINE NUMBER				
1	0	0	0	M3	M2	M1	M0
7	6	5	4	3	2	1	0

4th byte

1st BYTE: Bit 7 – Defined as 0.
D – "DESTINATION BIT".
This bit is always low, when sending from the PC to the switchers, and high for information sent to the PC.
N5…N0 – "INSTRUCTION".
These 6 bits define the function that is to be performed by the switcher(s). Similarly, if a function is performed via the machine's keyboard, then these bits are set with the INSTRUCTION NO, which was performed. The instruction codes are defined according to the table below (INSTRUCTION NO. is the value to be set for N5…N0).
2nd BYTE: Bit 7 – Defined as 1.
Bits 3 – 6 - Defined as 0.
I2… I0 – "INPUT".
For disconnect, set as 0. For other operations, these bits are defined according to Table 7.
3rd BYTE: Bit 7 – defined as 1.
Bits 2-6 defined as 0.
O1, O0 – "OUTPUT"
For operations, these bits are defined according to Table 7.
4th BYTE: Bit 7 – Defined as 1.
Bits 3-6 Defined as 0.
M3… M0 – "MACHINE NUMBER".
MACHINE NUMBER = (DIPSWITCH CODE) + 1.

Table 7: Instruction Codes

INSTRUCTION		DEFINITION FOR SPECIFIC INSTRUCTION		NOTE
#	DESCRIPTION	INPUT	OUTPUT	
0	RESET MACHINE	0	0	1
1	SWITCH GROUPS	1-4 Set equal to video and audio inputs to be switched for the relative group	1-3 Set equal to group to which output is to be switched	2
2	SWITCH AUDIO OUTPUTS	1-4 * Set equal to audio output to be switched to Master Audio out	1	2
5	REQUEST GROUP STATUS	0	1-3 Set equal to the group of which status is required	3
6	REQUEST STATUS OF MASTER AUDIO OUTPUT	0	1	3
8	BREAKAWAY SETTING	0	0 – Audio-follow-video 1 – Audio breakaway	2
11	REQUEST BREAKAWAY SETTING	0	0	3
16	ERROR	Don't care	0 – Invalid instruction 1 – Out of range	4
18	RESET MACHINE	0	0	1
22	SET AUDIO GAIN OF MASTER AUDIO OUTPUT	1	gain value	7
24	INCREASE/DECREASE AUDIO GAIN	1	0 – Increase gain 1 – Decrease gain	8
25	REQUEST GAIN	1	0 – Video gain 1 – Audio gain	3, 9
30	LOCK FRONT PANEL	0 – Panel unlocked 1 – Panel locked	0	
31	REQUEST WHETHER PANEL IS LOCKED	0	0	3
57	SET AUTO SAVE	1 – Autosave 2 – No save	Don't care	5
61	IDENTIFY MACHINE	1 or 2 – Machine name 3 or 4 – Program version	Don't care	6
62	DEFINE MACHINE	1 – Number of inputs 2 – Number of outputs	1 – For video 2 – For audio	3

* # 4 - for microphone
NOTES on to Table 7:

NOTE 1

When the master switcher is reset, (e.g. when it is turned on), the reset code is sent to the PC. If this code is sent to the switchers, it will reset according to the present power-down settings.

NOTE 2

These are bi-directional definitions. That is, if the switcher receives the code, it will perform the instruction; and if the instruction is performed (due to a keystroke operation on the front panel), then these codes are sent. For example, if:
0000 0001 Instruction "Switch Groups"

1000 0010 Input #2
1000 1001 in composite video group
1000 0001 Machine #1 (master)

Was sent from the PC, then the switcher (machine #1) will switch input 2 in composite video group to its output. If the user switched input 4 in the VGA group via the front panel keypad, then the switcher will send:

0100 0001
1000 0100
1000 0011
1000 0001 to the PC.

When the PC sends instruction #1 or #2 to the switcher, then, if the instruction is valid, the switcher replies by sending the same four bytes to the PC that were sent (except for the first byte, where the DESTINATION bit is set high).

NOTE 3

The reply to a "REQUEST" instruction is as follows: the same instruction and input codes as were sent are returned, and the OUTPUT is assigned to the value of the requested parameter. The reply to the instruction #5 (what is the status of the VGA group?):

0000 0101
1000 0000
1000 0011
1000 0001

Would be:

0100 0101
1000 0000
1000 0100
1000 0001

NOTE 4

An error code is returned to the PC if an invalid code was sent to the switcher (for example, when trying to switch an input or a group which is greater than the highest one defined). This code is also returned to the PC if an RS-232 instruction is sent while the machine is being programmed via the front panel. Reception of this code by the switcher will not be valid.

NOTE 5

Under normal conditions, the machine's present status is saved each time a change is made. The power-down save (the auto save) may be disabled using this code. Note that each time that the machine is turned ON, the auto save function is automatically set.

NOTE 6

This is a request to identify the switchers in a system. If the INPUT is set as 1 or 2, the machine will send its name. The reply is the decimal value of the INPUT and the OUTPUT. For example, the reply to the request to send the machine's name (for machine #001) will be:

0111 1101
1000 0000 (i.e. 128+0)
1001 0111 (i.e. 128+23)
1000 0001

If the request for identification is sent with the INPUT set as 3 or 4, the appropriate machine will send its software version number. Again, the reply would be the decimal value of the INPUT and OUTPUT - the INPUT representing the number in front of the decimal point, and the OUTPUT representing the number following the decimal point. For example, for version 3.5 the reply will be:

0111 1101
1000 0011 (i.e. 128+3)
1000 0101 (i.e. 128+5)
1000 0001

NOTE 7

GAIN VALUE – Number from 0 to 127
Gain Value = 0 Mute
Gain Value = 115 $V_{out} = V_{in}$
Gain Value = 127 $V_{out} = 2V_{in}$

NOTE 8

One step = 0. 5 dB

NOTE 9

Answer = Current Audio Gain (0 –127)

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for three years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed.
3. Damage, deterioration or malfunction resulting from:
   - i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   - ii) Product modification, or failure to follow instructions supplied with the product
   - iii) Repair or attempted repair by anyone not authorized by Kramer
   - iv) Any shipment of the product (claims must be presented to the carrier)
   - v) Removal or installation of the product
   - vi) Any other cause, which does not relate to a product defect
   - vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.
NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.
This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC Rules and Regulations: Part 15: "Radio frequency devices Subpart B – Unintentional radiators"

CAUTION!

- ⌦ Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- ⌦ Use the supplied DC power supply to feed power to the machine.
- ⌦ Please use recommended interconnection cables to connect the machine to other components.

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com, where updates to this user manual may be found.
We welcome your questions, comments and feedback.

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